

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

3G LICENSING, S.A., KONINKLIJKE KPN
N.V., and ORANGE S.A.,

Plaintiffs,

v.

BLACKBERRY LIMITED and BLACKBERRY
CORPORATION,

Defendants.

3G LICENSING, S.A., KONINKLIJKE KPN
N.V., and ORANGE S.A.,

Plaintiffs,

v.

HTC CORPORATION,

Defendant.

3G LICENSING, S.A., KONINKLIJKE KPN
N.V., and ORANGE S.A.,

Plaintiffs,

v.

LENOVO HOLDING CO., INC.,
LENOVO (UNITED STATES) INC.
and MOTOROLA MOBILITY LLC,

Defendants.

3G LICENSING, S.A., KONINKLIJKE KPN
N.V., and ORANGE S.A.,

Plaintiffs,

v.

C.A. No. 17-82-LPS-CJB

C.A. No. 17-83-LPS-CJB

C.A. No. 17-84-LPS-CJB

C.A. No. 17-85-LPS-CJB

LG ELECTRONICS INC., LG ELECTRONICS,
U.S.A., INC. and LG ELECTRONICS
MOBILECOMM U.S.A., INC.,

Defendants.

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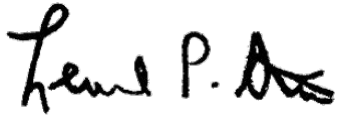
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MEMORANDUM OPINION

September 13, 2018
Wilmington, Delaware



STARK, U.S. District Judge:

Plaintiffs sued multiple Defendants in numerous related actions for alleged infringement of several patents. Presently before the Court are the parties' disputes over the meaning of disputed terms in the asserted claims of the four patents remaining at issue: U.S. Patent Nos. 9,014,667 ("667 patent"), 7,933,564 ("564 patent"), 7,995,091 ("091 patent"), and 6,856,818 ("818 patent"). The parties submitted claim construction briefs (*see* D.I. 123, 126, 138, 140), expert declarations (*see* D.I. 125, 139, 142), technology tutorials (*see* D.I. 130, 131, 132), and objections to the tutorials (*see* D.I. 137, 141).¹ The Court held a claim construction hearing on June 25, 2018, at which both sides presented oral argument. (*See* D.I. 147 ("Tr.")) Later, the parties agreed upon certain constructions and proposed certain amended constructions. (*See* D.I. 145, 148)

I. LEGAL STANDARDS

A. CLAIM CONSTRUCTION

The ultimate question of the proper construction of a patent is a question of law. *See Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 837 (2015) (citing *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 388-91 (1996)). "It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (internal quotation marks omitted).

"[T]here is no magic formula or catechism for conducting claim construction." *Id.* at 1324. Instead, the Court is free to attach the appropriate weight to appropriate sources "in light of the statutes and policies that inform patent law." *Id.*

¹Unless otherwise noted, all references to the docket index ("D.I.") are to C.A. No. 17-83.

“[T]he words of a claim are generally given their ordinary and customary meaning [which is] the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Id.* at 1312-13 (internal citations and quotation marks omitted). “[T]he ordinary meaning of a claim term is its meaning to the ordinary artisan after reading the entire patent.” *Id.* at 1321 (internal quotation marks omitted). The patent specification “is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996).

While “the claims themselves provide substantial guidance as to the meaning of particular claim terms,” the context of the surrounding words of the claim also must be considered. *Phillips*, 415 F.3d at 1314. Furthermore, “[o]ther claims of the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment . . . [b]ecause claim terms are normally used consistently throughout the patent.” *Id.* (internal citation omitted).

It is likewise true that “[d]ifferences among claims can also be a useful guide. . . . For example, the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.” *Id.* at 1314-15 (internal citation omitted). This “presumption is especially strong when the limitation in dispute is the only meaningful difference between an independent and dependent claim, and one party is urging that the limitation in the dependent claim should be read into the independent claim.” *SunRace Roots Enter. Co., Ltd. v. SRAM Corp.*, 336 F.3d 1298, 1303 (Fed. Cir. 2003).

It is also possible that “the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the

inventor's lexicography governs." *Phillips*, 415 F.3d at 1316. It bears emphasis that "[e]ven when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction." *Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1372 (Fed. Cir. 2014) (quoting *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004)) (internal quotation marks omitted).

In addition to the specification, a court "should also consider the patent's prosecution history, if it is in evidence." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370 (1996). The prosecution history, which is "intrinsic evidence," "consists of the complete record of the proceedings before the PTO [Patent and Trademark Office] and includes the prior art cited during the examination of the patent." *Phillips*, 415 F.3d at 1317. "[T]he prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be." *Id.*

In some cases, "the district court will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period." *Teva*, 135 S. Ct. at 841. Extrinsic evidence "consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Markman*, 52 F.3d at 980. For instance, technical dictionaries can assist the court in determining the meaning of a term to those of skill in the relevant art because such dictionaries "endeavor to collect the

accepted meanings of terms used in various fields of science and technology.” *Phillips*, 415 F.3d at 1318. In addition, expert testimony can be useful “to ensure that the court’s understanding of the technical aspects of the patent is consistent with that of a person of skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field.” *Id.* Nonetheless, courts must not lose sight of the fact that “expert reports and testimony [are] generated at the time of and for the purpose of litigation and thus can suffer from bias that is not present in intrinsic evidence.” *Id.* Overall, while extrinsic evidence “may be useful” to the court, it is “less reliable” than intrinsic evidence, and its consideration “is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence.” *Id.* at 1318-19. Where the intrinsic record unambiguously describes the scope of the patented invention, reliance on any extrinsic evidence is improper. *See Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1308 (Fed. Cir. 1999) (citing *Vitronics*, 90 F.3d at 1583).

Finally, “[t]he construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.” *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998). It follows that “a claim interpretation that would exclude the inventor’s device is rarely the correct interpretation.” *Osram GmbH v. Int’l Trade Comm’n*, 505 F.3d 1351, 1358 (Fed. Cir. 2007) (quoting *Modine Mfg. Co. v. U.S. Int’l Trade Comm’n*, 75 F.3d 1545, 1550 (Fed. Cir. 1996)).

B. INDEFINITENESS

A patent claim is indefinite if, “viewed in light of the specification and prosecution history, [it fails to] inform those skilled in the art about the scope of the invention with

reasonable certainty.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014). A claim may be indefinite if the patent does not convey with reasonable certainty how to measure a claimed feature. *See Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 789 F.3d 1335, 1341 (Fed. Cir. 2015). But “[i]f such an understanding of how to measure the claimed [feature] was within the scope of knowledge possessed by one of ordinary skill in the art, there is no requirement for the specification to identify a particular measurement technique.” *Ethicon Endo-Surgery, Inc. v. Covidien, Inc.*, 796 F.3d 1312, 1319 (Fed. Cir. 2015).

II. CONSTRUCTION OF DISPUTED TERMS²

A. The ’667 Patent³

The ’667 patent “relates to a telecommunications network configured for providing access to a plurality of terminals” and a method of permitting access to that network. ’667 Patent Abstract. The patent discloses mechanisms that enable the network to deny access to terminals when network resources are stretched. *See id.* 1:23-40. The network includes “a register, an access request receiver and an access module.” *Id.* Abstract. Each terminal has a “unique identifier” to access the network. *Id.* “The register is configured for storing the unique identifier of at least one terminal in combination with at least one grant access time interval . . . during which access for the terminal is permitted.” *Id.* “The access module is configured for denying access for the terminal if the access request is received outside the time interval” *Id.*

²Certain claim terms are no longer in dispute. (*See* D.I. 145, 148) The Court will adopt the agreed-upon constructions.

³All four disputed terms of this patent appear in claims 31, 33, and 35; the first three disputed terms have been previously construed by a different court. (D.I. 124 Ex. 1)

1. “deny access time interval”⁴

Plaintiffs “time slot, bounded by particular (albeit potentially variable) beginning and end times, during which access to the telecommunications network is denied”
Defendants “time slot, bounded by particular beginning and end times, (which are potentially variable, i.e., the previously scheduled particular beginning and end times may potentially be modified by a network operator’s plan prior to the time slot), during which access to the telecommunications network is denied”
Court “time slot, bounded by particular (albeit potentially variable) beginning and end times, during which access to the telecommunications network is denied”

The parties, relying on a construction of this term by a previous court, agree that the term refers to a time slot during which access to the telecommunications network is denied. The previous court noted that the time slot is “bounded by particular (albeit potentially ‘variable,’ *see* ’667 Patent at 4:65) beginning and end times.” (D.I. 124 at 74) During oral argument, the parties’ dispute narrowed to the meaning of variable. (*See* Tr. at 14-26) Defendants argue that variable means “the network operator who is controlling [time slot] can determine for scheduling purposes the particular beginning and end time they want, but it doesn’t mean that these are totally open and random timers that can be set on the fly at any time.” (*Id.* at 15) Plaintiffs argue that the meaning of variable is not limited to just allowing prescheduled time slots but also contemplates changing the time slots in a dynamic manner. ((*See id.* at 19-21; *see also id.* at 20-21 (“[W]hat the patent contemplates and what the claims cite is a network that is monitoring the load and that is able to dynamically and variably specify a time interval when . . . access will be denied”))

⁴The table reflects the parties’ amended constructions for this term. (*See* D.I. 148 at 2)

The Court agrees with Plaintiffs. The patent explains that “a variable time interval x-y is scheduled, depending on the network load experienced by or expected for the telecommunications network.” ’667 patent, 4:65-67. This variable time interval is not limited to a predetermined time slot. Instead, “[n]etwork monitoring may be *real time* and/or be based on the expected network load .” (*Id.* at 5:43-44) (emphasis added) The dynamic nature of the time interval is reflected in the claim language “the time period is adapted by the telecommunications network depending on a monitored network load.” (*Id.* at 14:7-8) The Court is not persuaded by Defendants that Plaintiffs’ position in a related Inter Partes Review involved a clear and unmistakable disclaimer. (*See, e.g.*, Tr. at 22-23)

2. “machine-to-machine applications”

Plaintiffs
As previously construed, “applications that allow for data communication between devices and that normally operate without human intervention”
Defendants
“applications to communicate data between machines that normally operate without human intervention”
Court
“applications that allow for data communication between devices and that normally operate without human intervention”

The parties agree that the term relates to operations that normally proceed without human intervention, but dispute whether the patent refers to applications (Plaintiffs’ position) or machines (Defendants’ position). Plaintiffs argue that Defendants’ emphasis on machines is improper because the patent describes “*applications* as the entities that normally operate without human intervention,” and this is how a person of ordinary skill in the art (“POSA”) familiar with network standards mentioned in the patent would have understood the term. (D.I. 123 at 3)

(emphasis added by Plaintiffs) Defendants argue that Plaintiffs’ construction is too broad because it “could read on generic network applications that run in the background (e.g., on servers) ‘without human interaction’ to allow any type of data communication between any type of devices in the telecommunications network, even if the servers themselves otherwise operate with human interaction.” (D.I. 126 at 4)

The Court agrees with Plaintiffs. Defendants’ construction is too narrow and improperly reads specific embodiments described in the specification into the claims. *See Phillips*, 415 F.3d at 1323. Nothing in the intrinsic evidence suggests that the term is limited to machines that normally operate without human intervention.⁵ The patent explains that “**some** machine-to-machine (M2M) applications do not require the transfer of data to be immediate,” and “[i]f these applications are prevented from claiming one or more network resources during e.g. peak load hours, network resources can be saved.” ’667 patent, 2:50-54 (emphasis added). The patent also explains that “M2M applications **typically** involve hundreds or thousands of devices that only rarely require access to a telecommunications network.” *Id.* 2:56-58 (emphasis added).

⁵Plaintiffs, however, acknowledged during oral argument that the patent is limited to machine-to-machine applications and does not cover human-to-human or human-to-machine communications, e.g., an emergency phone call or call to family members. (*See* Tr. at 44-49)

3. “unique identifier”⁶

Plaintiffs Plain meaning; alternatively, “information enabling unique identification at a particular moment in time of the terminal in the telecommunications network”
Defendants “terminal identifier that is unique within the telecommunication network to provide access to the entire network from all locations at all terms (unlike a temporary identifier which is assigned only for a particular access or a particular locations)”
Court “information enabling unique identification at a particular moment in time of the terminal in the telecommunications network”

Plaintiffs argue that “Defendants’ construction provides no additional clarity to the term.” (D.I. 123 at 5) Defendants argue that “Plaintiffs’ alternative construction seeks to read ‘unique’ out of this claim term” and is overly broad. (D.I. 126 at 5; *see also* D.I. 140 at 4)

The Court agrees with Plaintiffs. The patent explains that “[e]ach terminal comprises a unique identifier for accessing the telecommunications network.” ’667 patent, 1: 46-47. According to the patent, the unique identifier is stored in a network register and is “preferably associated with a subscription of the terminal, e.g. the identifier of a SIM (IMSI) that is available in the terminal.” *Id.* 1: 47-52.

⁶The table reflects the parties’ amended constructions. (*See* D.I. 33 at 3)

4. “peak load time intervals”

Plaintiffs “time periods during which there is or is expected to be a higher than average quantity of network traffic”
Defendants Indefinite
Court “time periods during which there is or is expected to be a higher than average quantity of network traffic”

Defendants argue that the term is indefinite because the patent provides “no guidance either to ‘peak load’ or the beginning and end of the ‘time interval.’” (D.I. 126 at 5) Plaintiffs respond that the meaning of the term is self-evident from the patent and a POSA would understand that the term has a specific meaning in the art. (D.I. 123 at 6-7)

The Court agrees with Plaintiffs. The patent provides information sufficient for a POSA to understand with reasonable certainty the meaning of peak load and the beginning and end of the time interval. According to the patent’s claims, for example, the “terminal for the machine-to-machine applications are denied access to the telecommunications network during peak load time intervals.” 667 patent, 14:17-20. The patent explains that network resources could be saved if “some machine-to-machine (M2M) applications,” which “do not require the transfer of data to be immediate,” “are prevented from claiming one or more network resources during e.g. *peak load hours*.” *Id.* 2:50-54 (emphasis added). With respect to another time interval, a “deny access time interval,” the patent refers to it as “a time period.” *Id.* 14:4-6.

The patent also provides specific examples of time intervals when access to the network could be granted or denied. *See id.* 4:60-5:7 (noting that “[0000-0500 am] time intervals are typically *off-peak intervals* for most days of the year”) (emphasis added); *id.* 7:34-39 (noting

“network provider may . . . charge . . . high rate for data sent outside the *off-peak time* . . . [which] only provides an incentive to not send data during the expensive *peak hour*”) (emphasis added). While the patent does not expressly define the term, the Court is persuaded by Plaintiffs’ expert that a POSA would understand the meaning of this term from the patent’s context as referring to a higher than average quantity of traffic in the network. (See D.I. 123 at 6-7) (citing D.I. 125 ¶¶ 31-38) The patent’s reference to a certain network standard, “3 GGP TS 23.060 (Release 7),” ’667 patent, 2:25, provides additional support. (See D.I. 125 ¶ 38) (Plaintiffs’ expert explaining that this standard shows POSA term relates to “time periods during which the network had entered a ‘congestion’ condition”) In sum, Defendants have not met their burden to show by clear and convincing evidence that the term is indefinite.⁷

C. The ’091 Patent

The ’091 patent “relates to techniques for setting up calls consisting of voice and video data, [referred to as “mixed media data,”] across telecommunications networks, and a hardware and software interface and method of operating” such calls. ’091 patent, 1:20-27. Setting up a mixed media telecommunication call, according to the patent, involves “transferring communication between communication channels of differing bandwidth . . .” *Id.* Abstract. This is accomplished, for example, by “establishing data communications” on two different channels with different bandwidths. *See id.* (explaining that data communication is established “on a first channel having a first bandwidth” and “on a second channel in response to a trigger indicating changes in the data to be communicated, wherein the second channel has a bandwidth

⁷Notably, as Defendants acknowledge, their expert has not opined that a POSA would not understand with reasonable certainty what this term means in the patent’s context. (See Tr. at 77, 91)

providing resources different from the first bandwidth of the first channel.”). The patent also allows a user to switch from a video call to a voice-only call. *See id.* (“The method further comprises responding to the discontinuation of an in-progress mixed-media call that transmits data using a first and second media by initiating a second call not supporting the second media.”); *see also id.* Fig. 2 (illustrating “call flow for switching from video to voice mode”).

1. “the release of the first call”⁸

Plaintiffs Plain meaning; no construction necessary. Alternatively: “the termination of the first call”
Defendants Indefinite
Court “the termination of the first call”

Defendants argue that the term is indefinite due to lack of an “antecedent basis for ‘the release,’ as ‘a release’ does not appear anywhere in the claims.” (D.I. 126 at 19) Plaintiffs argue that a POSA “would have no trouble ascertaining the scope of this claim.” (D.I. 123 at 19)

A failure to provide antecedent basis does not necessarily render a claim indefinite. *See Energizer Holdings, Inc. v. Int’l Trade Comm’n*, 435 F.3d 1366, 1370 (Fed. Cir. 2006). If, “despite the absence of explicit antecedent basis . . . the scope of a claim would be reasonably ascertainable by those skilled in the art, then the claim is not indefinite.” *Id.* at 1370-71 (internal quotation marks omitted); *see also Nautilus*, 134 S. Ct. at 2129 (holding that claims are not indefinite if, “viewed in light of the specification and prosecution history, [they] inform those skilled in the art about the scope of the invention with reasonable certainty”). Defendants must

⁸This term appears in claims 2-4 and 9-11.

prove by clear and convincing evidence that the lack of antecedent basis leaves one of ordinary skill in the art unable to discern the boundaries of the claim “based on the claim language, the specification, the prosecution history, and the knowledge in the relevant art.” *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1366 (Fed. Cir. 2011) (internal quotation marks omitted).

Here, the specification provides sufficient context for a POSA to understand the scope of the term with reasonable certainty despite the lack of an antecedent basis. The specification explains that the term simply means termination or end of the first call. *See* ’091 patent, 8:13-16 (“If the caller selects voice mode, the calling videophone ***releases the video call and makes a new (voice) call*** to the same number as the original call. This will incur a delay as the radio connection must be ***released and re-established***.”) (emphasis added); *id.* 11:31-32 (“A further variation could be to ***always release the first call before setting up the second***.”) (emphasis added); *id.*, 8:37-43 (explaining that in “networks where it is not possible to put data calls on hold, it is preferred that the method of FIG. 2 [illustrating ‘Release’] is used to transfer from video to voice.”). The Court also credits the testimony submitted by Plaintiffs’ expert to support this position. (*See* D.I. 125 ¶¶ 84-87) The record does not contain clear and convincing evidence of indefiniteness.

Defendants argue that Plaintiffs’ construction adds ambiguity to the meaning of release and discontinuation. (*See* D.I. 126 at 19) The Court disagrees. As Plaintiffs’ expert explains, (*see* D.I. 139 ¶¶ 31-32), the patent distinguishes between release and discontinuation, explaining that releasing a call and placing a call on hold are examples of discontinuation. *See* ’091 patent, 12:3-6, 17-20; *see also id.*, 8:37-43.

2. “the processor further being configured to, in response to the indication, initiate a second call to the remote videophone, the second call not supporting the second media”⁹

Plaintiffs

This limitation should not be interpreted as a means-plus-function limitation.
Plain meaning; no construction necessary.

HTC

This limitation should be interpreted as a means-plus-function limitation.
Function: in response to the indication, initiate a second call to the remote videophone, the second call not supporting the second media
Structure: Indefinite for failure to disclose corresponding structure.

Court

This element does not need construction under § 112 ¶ 6

The parties dispute whether the term, which lacks the word “means,” is a means-plus-function term. “[F]ailure to use the word “means” . . . creates a rebuttable presumption . . . that § 112, para. 6 does not apply.” *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015). This “presumption can be overcome and § 112, para. 6 will apply if the challenger demonstrates that the claim term fails to recite sufficiently definite structure or else recites function without reciting sufficient structure for performing that function.” *Id.* at 1349 (internal quotation marks and brackets omitted).

Defendants have not overcome that presumption. *See Masimo Corp. v. Philips Elecs. N. Am. Corp.*, 2015 WL 7737308, at *8 (D. Del. Dec. 1, 2015) (finding “processor configured to perform a method” not means-plus-function term where claim described structure for processor and its interaction with other claim components). Like the claim in *Masimo*, “the current claim

⁹This term appears in claim 1 and is argued only by defendant HTC Corp. (“HTC”). (*See* D.I. 117 at 21; C.A. No. 17-83 D.I. 133-2) The remaining defendants support HTC’s position. (*See* Tr. at 130) The remaining defendants also agree with Plaintiffs that this term has a plain meaning. (*See* D.I. 148 at 1 & n.1)

provides an input-output structure for the processor and explains how the processor interacts with the other components of the claim.” *Id.* The claim states that “a processor” is “in communication with the RF interface,” “receive[s] an indication, via the RF interface,” and “in response to the indication, initiate[s] a second call.” ’091 patent, 11:59-12:2. The specification describes the interaction of the processor with the other components and how it initiates the second call. *See, e.g., id.* 2:65-4:17 (explaining interaction of processor with ROM, RAM, and videocamera); *id.* Fig. 3 (showing schematic block diagram of main functional elements, including interaction of processor with other components). In this context, “processor” provides sufficient structure to avoid the need for construction under § 112. No further construction is necessary.

D. The ’818 Patent

The invention of the ’818 patent “relates to a removable data store for a user interface device, such as a mobile station used in a mobile communications system.” ’818 patent, 1:7-9. “One such data store is a subscriber identity module (SIM) as used in a GSM (Global System for Mobile communications) digital cellular radio system.” *Id.* 1:9-11. “In a known conventional GSM system, each mobile station, such as a mobile telephone handset, is provided with a SIM, also referred to as a smart card, which is inserted into the mobile station in order to allow the mobile station to receive service in a GSM network.” *Id.* 1:14-18. The patent explains that the removable data store, such as a smart card, is “provided with two alternative fixed dialling [sic] number lists . . . which are accessible by the mobile station.” *Id.* Abstract. According to the patent, “[t]he data store itself determines a mode of operation of the mobile station, for example a telephone line mode, in order to select between accessing the first list or the second list.” *Id.*

“This allows the alternate list feature to be implemented without requiring the mobile station . . . to be modified for compatibility with the removable data store” *Id.*

1. “standard subscriber data storage module”¹⁰

Plaintiffs “removable data store compliant with a technical specification of GSM 11.11 v.5.4.0 regarding the writing or reading of a data record” ¹¹
Defendants Indefinite. Alternatively, “a removable data store compliant with storage and retrieval protocols of GSM standard 11.11 that existed as of February 11, 1997” ¹²
Court “removable data store compliant with a technical specification of GSM 11.11 v.5.4.0 regarding the writing or reading of a data record”

2. “predetermined standard”¹³

Plaintiffs “technical specification of GSM 11.11 v.5.4.0 regarding the writing or reading of a data record” ¹⁴
Defendants Indefinite. Alternatively, “GSM standards existing as of February 11, 1997” ¹⁵
Court “technical specification of GSM 11.11 v.5.4.0 regarding the writing or reading of a data record”

¹⁰This term appears in claim 18.

¹¹This is Plaintiffs’ amended construction. (*See* D.I. 133 at 3)

¹²Defendants have proposed a construction if the term is not found to be indefinite. (*See* D.I. 126 at 23 n.19)

¹³This term appears in claim 18.

¹⁴This is Plaintiffs’ amended construction. (*See* D.I. 148 at 3)

¹⁵Defendants have proposed a construction if the term is not found to be indefinite. (*See* D.I. 126 at 23 n.19)

Defendants addressed these two terms together in their responsive brief and during oral argument. (See D.I. 140 at 20; Tr. at 147) They argue that “Claim 18 identifies mobile stations and data storage modules that are either ‘standard’ or ‘modified’ or comply with a ‘predetermined standard,’” without claiming any “specific standard.” (D.I. 126 at 21-23) In their view, the terms are indefinite because “[s]uch broad reference to ‘undefined’ standards” fails to provide any guidance for a POSA to understand the scope of these terms with reasonable certainty. (*Id.* at 22) Plaintiffs respond that the terms are not indefinite as a POSA would understand the patent refers to a “technical specification regarding storage and/or retrieval of the contents of the data record, such as GSM technical specification 11.11.” (D.I. 123 at 23)

The Court agrees with Plaintiffs. A POSA would understand with reasonable certainty what these terms mean in the patent’s context. The patent describes the invention in the context of “a GSM (Global System for Mobile communications) digital cellular radio system.” ’818 patent, 1:10-11. The specification describes the use of the “GSM standard.” *Id.*, 1:38-40, 1:53-56. It also incorporates by reference a specific GSM standard: “GSM technical specification 11.11.” *Id.*, 5:42-43.

Additionally, the prosecution history shows the patent examiner had no trouble analyzing the term in relation to a prior-art reference. (See D.I. 122, Ex. Q at 3; Ex. R at 3; *see also Sonix Tech. Co. v. Publications Int’l, Ltd.*, 844 F.3d 1370, 1380 (Fed. Cir. 2017) (“USPTO did not express any uncertainty as to the scope of ‘visually negligible,’ or encounter any apparent difficulty in applying the term to the references.”)) Defendants’ own preliminary invalidity contentions also support this position, as they compared the terms with a prior art reference and did not argue that the terms were indefinite. (See D.I. 124-7 at 1; *see also Sonix*, 844 F.3d at

1380 (“[Appellees’] initial invalidity contentions did not argue that ‘visually negligible’ was indefinite, and neither did their final contentions.”))

Defendants argue that “there are multiple versions of the GSM technical standard 11.11 that predate and post-date the effective filing date of the patent.” (D.I. 140 at 20) However, Plaintiffs have adequately addressed this concern by amending their constructions to refer to a particular GSM standard: 11.11 v.5.4.0. (D.I. 133 at 3)

3. “modified subscriber data storage module”¹⁶

Plaintiffs Plain meaning. Alternatively, “standard subscriber data storage module able to retrieve data selectively in accordance with an operational condition of the mobile station”
Defendants Indefinite
Court “standard subscriber data storage module able to retrieve data selectively in accordance with an operational condition of the mobile station”

4. “modified module”¹⁷

Plaintiffs Plain meaning. Alternatively, “modified subscriber data storage module”
Defendants Indefinite
Court “modified subscriber data storage module”

Defendants addressed these two terms together in their responsive brief and during oral argument. (See D.I. 140 at 21; Tr. at 172) Defendants argue that the terms are indefinite because

¹⁶This term appears in claim 18.

¹⁷This term appears in claim 18.

“the range of ‘standard’ data storage modules is so broad as . . . there is no defined point of reference for the modification, rendering the scope of any modification indeterminable.” (D.I. 140 at 21) In their view because “the ‘standard’ is unknown, any subclass of ‘modified’ standard subscriber data storage modules remains unknown to a reasonable degree of certainty.” (*Id.* at 22) But, as explained above, the Court agrees with Plaintiffs that a POSA would be able to understand with reasonable certainty from the patent’s context the claim refers to a particular GSM standard.

Defendants further argue that the term “modified subscriber data storage module” is indefinite because “it defines a module that is ‘modified’ relative to a ‘standard’ module identified in the preamble of claim 18, but the claim is silent as to when or how it is ‘modified’ beyond a ‘standard’ module.” (D.I. 126 at 23) The Court disagrees. As Plaintiffs’ expert explains, the modified subscriber data storage module has a processor and a memory and performs additional functions described in the claim, including for example, selectively retrieving data based on an operational condition of the mobile station. (*See* D.I. 125 ¶¶ 100-101, citing ’818 patent, 11:20-35)

5. “wherein the memory holds a plurality of data records corresponding to the specific data record and the processor is arranged to select one data record, from the plurality of data records, to access in response to the first memory access message, the selection being performed on the basis of data identifying a current operational condition of the mobile station and independently of the content of the first memory access message, the identifying data being held in a further data record in the memory means”¹⁸

Plaintiffs Plain meaning; no construction necessary.
Defendants Indefinite
Court Plain meaning; no construction necessary.

Defendants argue that the term is indefinite because “the claim is a mixed statutory claim,” requiring “both an apparatus and a method to perform an access of particular data records.” (D.I. 126 at 25) (citing *IPXL Holdings, L.L.C. v. Amazon.com, Inc.*, 430 F.3d 1377, 1384 (Fed. Cir. 2005) In *IPXL*, the Federal Circuit held that a single claim covering an apparatus and a method of use of that apparatus “is not sufficiently precise to provide competitors with an accurate determination of the metes and bounds of protection involved and is ambiguous and properly rejected under section 112, paragraph 2.” 430 F.3d at 1384 (internal quotation marks omitted). This is because “a manufacturer or seller of the claimed apparatus would not know from the claim whether it might also be liable for contributory infringement because a buyer or user of the apparatus later performs the claimed method of using the apparatus.” *Id.* Focusing on the claim language “system [including an input means]” and “the user uses the input means,” the court concluded that the claim was indefinite because it recited both “a system and a method for

¹⁸This term appears in claim 18.

using that system.” *Id.* (brackets in original).

Following *IPXL*, the Federal Circuit has considered other patents presenting similar indefiniteness challenges involving claims purportedly covering both an apparatus and a method. *See MasterMine Software, Inc. v. Microsoft Corp.*, 874 F.3d 1307, 1316 (Fed. Cir. 2017) (finding claim not indefinite where it recited “a reporting module . . . wherein the reporting module . . . presents a . . . database . . . receives from the user a selection of database fields . . . and generates a database query”); *UltimatePointer, L.L.C. v. Nintendo Co.*, 816 F.3d 816, 827 (Fed. Cir. 2016) (finding claim not indefinite where it recited “a handheld device including: an image sensor, said image sensor generating data” and other “generating data” limitations); *HTC Corp. v. IPCom GmbH & Co., KG*, 667 F.3d 1270, 1274 (Fed. Cir. 2012) (finding claim not indefinite where it recited “mobile station for use with a network . . . by storing link data . . . holding in reserve . . . initially maintaining . . . initially causing . . . deleting . . . freeing . . . arrangement for reactivating”); *In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d 1303, 1318 (Fed. Cir. 2011) (finding claim indefinite where it recited “interface means for providing automated voice messages . . . to certain of said individual callers, wherein said certain of said individual callers digitally enter data”); *Rembrandt Data Techs., LP v. AOL, LLC*, 641 F.3d 1331, 1339-40 (Fed. Cir. 2011) (finding claim indefinite because it included both apparatus limitations – “buffer means,” “fractional encoding means,” “second buffer means,” “trellis encoding means” – and method limitations – “transmitting the trellis encoded frames”); *Microprocessor Enhancement Corp. v. Texas Instruments Inc.*, 520 F.3d 1367, 1374-75 (Fed. Cir. 2008) (“*MEC*”) (finding claim not indefinite where it recited “method of executing instructions in a pipelined processor comprising: [structural limitations of the pipelined

processor]; the method further comprising: [method steps implemented in the pipelined processor]”) (brackets in original).

The disputed claim 18 is an apparatus claim for a “mobile station comprising . . . a modified subscriber data storage module which includes a processor . . . and memory.” In full, it reads:

A mobile station for use in a mobile communications system, the mobile station complying with a predetermined standard and being adapted, in accordance with the standard, to transmit a first memory access message, identifying a specific data record, in order to access the specific data record on a standard subscriber data storage module complying with the predetermined standard, the mobile station comprising:

a modified subscriber data storage module which includes a processor for performing operations and memory having data records for storing data,

the modified module being responsive to the first memory access message, identifying the specific data record,

wherein the memory holds a plurality of data records corresponding to the specific data record and the processor is arranged to *select* one data record, from the plurality of data records, to access in response to the first memory access message, the selection *being performed* on the basis of data identifying a current operational condition of the mobile station and independently of the content of the first memory access message, the identifying data being held in a further data record in the memory means.

(Emphasis added)

Defendants argue that the wherein clause introduces method steps requiring operation by a user of the claimed apparatus. (See D.I. 126 at 25; D.I. 140 at 23) Plaintiffs argue that this limitation “simply describes the claimed mobile station in terms of its capabilities,” and does not

require a user. (D.I. 123 at 25)

“[W]hile a claim directed to both a method and an apparatus may be indefinite, ‘apparatus claims are not necessarily indefinite for using functional language.’” *MasterMine*, 874 F.3d at 1313 (quoting *Microprocessor*, 520 F.3d at 1375). A “patent applicant is free to recite features of an apparatus either structurally or functionally.” *In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir.1997). Functional language describes something by means of what it does, not by means of what it is. *Id.*

In the Court’s view, the disputed wherein clause is functional in nature. Nothing in the claim requires a user to perform specific steps or take specific actions for the claim elements to be satisfied. Rather, the disputed claim language describes the functional features of the claimed data storage module and the operations of the claimed processor. Claim 18 is directed towards the components of a mobile communication systems. It does not require the user to use the described system. Like the claims in *MEC*, *HTC*, and *UltimatePointer*, the limitations at issue here merely claim that the system “possess[es] the recited structure [which is] capable of performing the recited functions.” *MEC*, 520 F.3d at 1375. Unlike the claims in *IPXL*, *Katz*, and *Rembrandt*, the claim limitations at issue reflect the capability of disclosed structures rather than the activities of the user. So long as a component in the system contains the functionality described, the component satisfies the claim element; user action is not required to establish infringement of this claim. Therefore, the claim is not indefinite.

B. The ’564 Patent

The ’564 patent relates to the field of “wireless digital communications” using a “multi-antenna system.” ’564 patent, 1:17-18, 21. In particular, the patent relates to “the

sending/reception of a signal that implements a precoding matrix in a MIMO (‘Multiple Input Multiple Output’) type multi-antenna system also called a ‘BLAST’ (Bell Laboratories Layered Space-Time”) system.” *Id.* 1: 19-22. It makes use of “transposed space-time mapping . . . to exploit the maximum capacity of the MIMO channel” *Id.* 2: 46; 53-54. Various “embodiments of the invention can be applied in the field of radio communications, especially for systems of the third, fourth and subsequent generations.” *Id.* 1: 23-25. According to an illustrative embodiment of the patent, “the invention is based on a novel system of linear precoding, at the time of sending, for a multi-antenna system.” *Id.* 5: 15-16.

1. **“means of linearly precoding said signal, implementing a matrix product of a source matrix, formed by said vectors organized in successive rows, by a linear precoding matrix, delivering a precoded matrix”¹⁹**

Plaintiffs Structure: “circuitry configured to carry out an algorithm as disclosed at 4:45-49, 5:24-41, and 5:66-67, or its equivalent”	Agreed Function: “linearly precoding said signal, implementing a matrix product of a source matrix, formed by said vectors organized in successive rows, by a linear precoding matrix, delivering a precoded matrix”
Defendants Structure: Indefinite for failure to disclose corresponding structure.	
Court Structure: “circuitry configured to carry out an algorithm as disclosed at 4:45-49, 5:24-41, and 5:66-67, or its equivalent”	

The parties agree that this is a means-plus-function term and also agree on its function, but dispute its structure.²⁰ “A patentee may express an ‘element in a claim for a combination’ ‘as

¹⁹This term appears in claim 12.

²⁰The parties agree as to the applicability of 35 U.S.C. § 112, ¶ 6 for all of the disputed means-plus-function terms in the ’564 patent and also agree on the function for those terms; the disputes are solely about the corresponding structure.

a means or step for performing a specified function without the recital of structure, material, or acts in support thereof.” *HTC Corp. v. IPCom GmbH & Co., KG*, 667 F.3d 1270, 1278 (Fed. Cir. 2012) (quoting 35 U.S.C. § 112 ¶ 6).²¹ “When a patentee invokes such ‘means-plus-function’ claiming, the ‘claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.’” *Id.* “A structure disclosed in the specification qualifies as a ‘corresponding structure’ if the specification or the prosecution history ‘clearly links or associates that structure to the function recited in the claim.’” *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1311-12 (Fed. Cir. 2012) (quoting *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997)). “Even if the specification discloses a ‘corresponding structure,’ the disclosure must be adequate; the patent’s specification must provide ‘an adequate disclosure showing what is meant by that [claim] language.’” *Id.* at 1311-12 (quoting *In re Donaldson Co.*, 16 F.3d 1189, 1195 (Fed. Cir. 1994) (en banc)).

Plaintiffs rely on expert testimony to argue that “[n]othing more is needed” than the algorithm described in the specification, from which a POSA would be able to understand the corresponding structure to perform the algorithm and carry out the claimed function. (See D.I.

²¹There is no dispute that the pre-AIA version of § 112 is applicable here because the patent application was filed before the effective date of the new version. See *Media Rights Techs., Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1371 (Fed. Cir. 2015) (“Paragraph 2 and Paragraph 6 of 35 U.S.C. § 112 were replaced by § 112(b) and § 112(f) respectively when the Leahy–Smith America Invents Act (“AIA”), Pub.L. No. 112–29, 125 Stat. 284 (2011) took effect on September 16, 2012. Because the application resulting in the asserted patent was filed before that date, we refer to the pre-AIA version of § 112.”).

123 at 12-13; D.I. 138 at 14) Defendants argue that the term is indefinite because neither “the requisite hardware necessary to perform the claimed function” nor “**any structure**” to perform the algorithm are disclosed in the specification, (D.I. 126 at 12) (emphasis added by Defendants), and Plaintiffs improperly “attempt to back-fill this deficiency through expert opinion” (D.I. 140 at 11).

The Court agrees with Plaintiffs. The specification adequately discloses the requisite hardware structure to perform the “linearly precoding” function. *See e.g.*, ’564 patent, 4:45-49 (“An embodiment of invention also relates to a device for sending a signal . . . **implementing M transmit antennas**, where M is greater than or equal to 2, for a sending method as described here above.”) (emphasis added); *id.* 5: 24-27 (“Referring now to FIG. 1, we present a system with **four transmit antennas implementing a source matrix X and a precoding matrix T** according to an embodiment of the invention.”) (emphasis added).

The Court also credits testimony submitted by Plaintiffs’ expert that a POSA at the time of the invention would have known how to implement the disclosed algorithm in a mutli-antenna system. (*See* D.I. 125 ¶¶ 57-63) (explaining that POSA would know “[n]either transmission nor reception of digital information on antennas is possible without further circuitry”)

Defendants do not argue that the algorithm to perform the claimed function is itself inadequately disclosed. Instead, they argue “there is no disclosure of ‘circuitry,’ let alone ‘circuitry configured to’ perform the specific algorithm identified by Plaintiffs.” (D.I. 126 at 12) But the patent need not explicitly disclose the circuitry to “overcome an indefiniteness challenge,” if a POSA would understand the operation of the transmit antennas using the disclosed algorithms. *See HTC*, 667 F.3d at 1279-80 (rejecting argument that POSA would not

know what “precise ‘circuitry,’ ‘components,’ or ‘schematics’ would be . . . employed” and noting “case law does not require that level of hardware disclosure . . . [a]s long as a sufficient algorithm describing how a general-purpose computer will perform the function is disclosed”).

The cases Defendants rely upon (*see* D.I. 126 at 11-12) are inapposite. None holds that a patent’s failure to disclose specific hardware necessary to perform the algorithm described in the specification and carry out the means-plus-function limitation makes the claims indefinite. *See e.g., Noah*, 675 F.3d at 1319 (holding claims indefinite where specification “disclosed an algorithm for performing only one of the functions associated with the “access means” limitation,” which meant no algorithm to perform claimed function was disclosed); *WMS Gaming, Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1348 (Fed. Cir. 1999) (holding that district court correctly determined structure was “an algorithm executed by a computer,” but “erred by failing to limit the claim to the algorithm disclosed in the specification”); *but see Fujitsu Ltd. v. Tellabs Operations, Inc.*, 782 F. Supp. 2d 635, 651 (N.D. Ill. 2011) (non-binding decision pre-dating Federal Circuit opinion in *HTC*).

2. “means for successively sending precoded vectors corresponding to columns of said precoded matrix, wherein each precoded vector has M symbols, which have undergone a precoding by a same column of the linear precoding matrix and are distributed over said M antennas”²²

Plaintiffs Structure: “circuitry configured to carry out an algorithm as disclosed at 4:45-49, 5:24-35, and 6:1-23, or its equivalent”	Agreed Function: “successively sending precoded vectors corresponding to columns of said precoded matrix, wherein each precoded vector has M symbols, which have undergone a precoding by a same column of the linear precoding matrix and are distributed over said M antennas”
Defendants Structure: Indefinite for failure to disclose corresponding structure.	
Court Structure: “circuitry configured to carry out an algorithm as disclosed at 4:45-49, 5:24-35, and 6:1-23, or its equivalent”	

The parties again dispute only the structure for this means-plus-function term, again disagreeing only as to whether the patent discloses the necessary structure to perform the algorithm described in the specification, which Plaintiffs rely upon to show how the function is carried out. As with the “means of linearly precoding” term, the Court agrees with Plaintiff that the corresponding structure for the “means for successively sending precoded vectors” term is the antenna-related circuitry of the claimed multi-antenna system. The specification discloses the algorithm to perform the function. *See* ’564 patent, 4:45-49, 5:24-35, 6:1-23. Based on this disclosure, a POSA would understand that circuitry is needed to carry out the algorithm. The Court credits the testimony of Plaintiffs’ expert in support of this conclusion. (*See* D.I. 125 ¶¶ 64-66)

²²This term appears in claim 12.

3. “means of reception, on said P antennas, of reception vectors”²³

Plaintiffs Structure: “circuitry configured to carry out an algorithm as disclosed at 4:50-53 and 6:45-50, or its equivalent”	Agreed Function: “reception, on said P antennas, of reception vectors”
Defendants Structure: Indefinite for failure to disclose corresponding structure.	
Court Structure: “circuitry configured to carry out an algorithm as disclosed at 4:50-53 and 6:45-50, or its equivalent”	

The parties again dispute whether the patent adequately discloses the necessary structure to perform the algorithm described in the specification, which Plaintiffs rely upon to show how the function is carried out. As explained above for the previous means-plus-function terms, the Court agrees with Plaintiffs that the corresponding structure for this means-plus-function term is also the antenna-related circuitry of the claimed multi-antenna system. The specification discloses the algorithm to perform the “means of reception” function. *See* ’564 patent, 4:50-53, 6:45-50. Based on this disclosure, a POSA would understand that circuitry is needed to perform the algorithm. The Court credits the testimony of Plaintiffs’ expert in support of this conclusion. (*See* D.I. 125 ¶¶ 67-70) (explaining that specification discloses algorithm to carry out function, which also notes “‘means of reception’ is on the ‘P antennas’”)

²³This term appears in claim 13.

4. “means of distribution by columns of said reception vectors in a reception matrix, wherein each reception vector comprises P received symbols distributed on said P receiver antennas and corresponding symbols having undergone a precoding by a same column of a linear precoding matrix at sending”²⁴

Plaintiffs Structure: “circuitry configured to carry out an algorithm as disclosed at 4:50-53, 5:66-6:14, 6:24-28, and 6:47-50, or its equivalent”	Agreed Function: “distribution by columns of said reception vectors in a reception matrix, wherein each reception vector comprises P received symbols distributed on said P receiver antennas and corresponding symbols having undergone a precoding by a same column of a linear precoding matrix at sending”
Defendants Structure: Indefinite for failure to disclose corresponding structure.	
Court Structure: “circuitry configured to carry out an algorithm as disclosed at 4:50-53, 5:66-6:14, 6:24-28, and 6:47-50, or its equivalent”	

The parties again dispute whether the patent adequately discloses the necessary structure to perform the algorithm described in the specification, which Plaintiffs rely upon to show how the function is carried out. As explained above for the previous means-plus-function terms, the Court agrees with Plaintiff that the corresponding structure for this means-plus-function term is the antenna-related circuitry of the claimed multi-antenna system. The specification discloses the algorithm to perform the “means of distribution” function. *See* 564 patent, 6:47-50 (“After transmission in the MIMO channel, the received signals are constituted by vectors R_i (for $i=1$ to 4) organized in successive columns in a reception matrix R , where $R_1=[r_1 \ r_5 \ r_9 \ r_{13}]$, $R_2=[r_2 \ r_6 \ r_{10} \ r_{14}]$, $R_3=[r_3 \ r_7 \ r_{11} \ r_{15}]$, $R_4=[r_4 \ r_8 \ r_{12} \ r_{16}]$.”) It also describes the “corresponding symbols” algorithm. *Id.* 5:66-6:14, 6:24-28. Based on this disclosure, a POSA would understand that

²⁴This term appears in claim 13.

circuitry is needed to perform the algorithm. The Court credits the testimony of Plaintiffs’ expert in support of this conclusion (*See* D.I. 125 ¶¶ 71-75)

5. **“means of processing of said reception matrix, comprising means of multiplying^[25] by a linear de-precoding matrix representing the linear precoding matrix used at sending, so as to obtain a de-precoded matrix by which it is possible to extract an estimation of source symbols sent”²⁶**

Plaintiffs Structure: “circuitry configured to carry out an algorithm as disclosed at 4:50-53 and 6:60-7:56, or its equivalent, or at 4:50-53 and 7:57-8:49, or its equivalent”	Agreed Function: “processing of said reception matrix, comprising means of multiplying by a linear de-precoding matrix representing the linear precoding matrix used at sending, so as to obtain a de-precoded matrix by which it is possible to extract an estimation of source symbols sent”
Defendants Structure: ““The receiver’ disclosed at 7:44-46 carrying out the algorithm disclosed at 6:60-7:56 or 7:57-8:49” ²⁷	
Court Structure: “circuitry configured to carry out an algorithm as disclosed at 4:50-53 and 6:60-7:56, or its equivalent, or at 4:50-53 and 7:57-8:49, or its equivalent”	

Unlike the previous means-plus-function terms, which Defendants argued are indefinite due to lack of any disclosed structure, for this means-plus-function term Defendants agree that a structure is disclosed in the specification. (*See* D.I. 126 at 15) The parties’ dispute is over the identification of the structure: whether it is circuitry to perform the algorithms described in the specification (Plaintiffs’ position) or is instead limited to a “receiver” (Defendants’ position).

²⁵The “means of multiplying” is a separate means-plus-function term, for which the parties initially sought a construction. (*See* D.I. 106 at 16) Later, the parties agreed to not seek construction of this term. (*See* D.I. 109 at 15 n.5)

²⁶This term appears in claim 13.

²⁷To the extent Defendants are arguing this term is indefinite for lack of adequately disclosed structure (*see* Tr. at 196-97, 206), the Court finds they have failed to meet their burden.

The Court agrees with Plaintiffs. Contrary to Defendants’ construction, the specification does not limit the corresponding structure to the “receiver” disclosed in the specification. (*See* D.I. 126 at 15-16) (citing ’564 patent, 7:44-46)²⁸ The Court credits the testimony of Plaintiffs’ expert in support of this conclusion. (*See* D.I. 125 ¶¶ 80-83)

6. “implementing a matrix product of a source matrix, [which are] formed by said vectors organized in successive rows, by a linear precoding matrix”²⁹

<p>Plaintiffs Plain meaning. Alternatively, “including by performing a multiplication of the rows of a source matrix, which are formed by said vectors organized in successive rows, by the columns of a linear precoding matrix”</p>
<p>Defendants “multiplying the rows of a source matrix, which are formed by said vectors organized in successive rows, by the columns of a linear precoding matrix”</p>
<p>Court “including by performing a multiplication of the rows of a source matrix, which are formed by said vectors organized in successive rows, by the columns of a linear precoding matrix”</p>

The parties agree that “implementing a matrix product” requires multiplying rows of the source matrix by columns of the precoding matrix, but dispute whether the claimed “linear precoding matrix” entails performing a multiplication of a source matrix without excluding the possibility of other steps (Plaintiffs’ position) or excludes the possibility of other

²⁸The specification describes two alternative “processing” algorithms. *See* ’564 patent, 7:44-47 (“The receiver then multiplies the matrix of estimated symbols obtained S by a de-precoding matrix, to form a de-precoded matrix {circumflex over (X)} used to extract an estimation of the source symbols sent”); *id.* at 7:57-8:49 (“[T]he receiver multiplies the reception matrix R . . . by the inverse of a total matrix G . . . also called a de-precoding matrix . . . to obtain a vector . . corresponding to the estimation of the symbols sent by the source matrix X in a de-precoded matrix”).

²⁹This term appears in claims 1 and 12.

steps (Defendants' position). Plaintiffs argue that Defendants' construction reads out "implementing" and ignores the "one or more" meaning inherent in the term "**a** matrix product." (D.I. 123 at 9) (emphasis added) (citing *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008)) Defendants argue that the patent repeatedly describes the linear precoding as "having undergone the same precoding by column" and discloses no other steps directed to "implementing a matrix product." (D.I. 140 at 8)

The Court agrees with Plaintiffs. The record contains no evidence of a "clear intent" to depart from the general rule for the article "a:" "'a' or 'an' in patent parlance carries the meaning of 'one or more' in open-ended claims containing the transitional phrase 'comprising.'" *Baldwin Graphic* 512 F.3d at 1342. "The exceptions to this rule are extremely limited: a patentee must 'evinced a **clear intent**' to limit 'a' or 'an' to 'one.'" *Id.* (internal brackets omitted) (emphasis added); *see also TiVo, Inc. v. EchoStar Commc'ns Corp.*, 516 F.3d 1290, 1303 (Fed. Cir. 2008) ("The general rule does not apply when the **context clearly evidences** that the usage is limited to the singular.") (emphasis added).

Here, the claims are open-ended, containing the transitional phrase comprising. In Defendants' view, "the claim recites that the precoded vectors of **said precoded matrix** have 'undergone a precoding by a same column of the linear precoding matrix,'" and "the specification only describes linear precoding as consisting of multiplying the rows of the source matrix by the columns of a linear precoding matrix." (D.I. 140 at 8-9) (citing '564 Patent at 5:24-6:11) (emphasis added by Defendants). "The subsequent use of definite articles 'the' or 'said' in a claim to refer back to the same claim term does not change the general plural rule, but simply reinvokes that non-singular meaning." *Baldwin Graphic*, 512 F.3d at 1342.

7. “vector”³⁰

Plaintiffs Plain meaning. Alternatively, “single row or column of one or more symbols”
Defendants “a single row or column of multiple symbols”
Court “single row or column of multiple symbols”

The parties dispute whether this term may be satisfied by just a single symbol (Plaintiffs’ position) or requires multiple symbols (Defendants’ position). Plaintiffs argue that the term is defined in the claims and their construction is also how a POSA would understand it. (D.I. 123 at 10) Defendants argue that Plaintiffs’ construction lacks support in the intrinsic evidence and would also render the term superfluous. (D.I. 126 at 8)

The Court agrees with Defendants. Nothing in the specification, claim language, or prosecution history supports Plaintiffs’ construction. While theoretically “a vector sometimes can comprise a single symbol” and overlap with a matrix, as Plaintiffs argue (D.I. 138 at 8), in the context of the patent, it must consist of multiples symbols. *See, e.g.*, ’564 patent, claims 1, 5, 11; Figs. 1, 2A and 2B; 2:30-41, 2:57-67, 3:5-29, 3:34-37, 4:35-49, 5:14-65, 6:1-3, 6:29-33, 6:47-50, 7:38-43. For instance, the claim language uses two variables, M and N, to describe a vector. *See id.* Claim 1, 10:5-18 (noting that “each vector compris[es] N source symbols to be sent” and “each precoded vector has M symbols”) While the patent is silent on the numerical range for the variable N, it explains that the variable M, which occurs in the context of both “M transit antennas” and “M symbols,” is “greater than or equal to 2.” (*See id.*) The prosecution

³⁰This term appears in claims 1, 5, 11-13.

history further supports the conclusion that a vector requires multiple symbols. (See D.I. 122-13 Ex. M at p. 11 of 12)

8. “matrix”³¹

Plaintiffs Plain meaning. Alternatively, “one or more rows and columns of one or more symbols or values”
Defendants “multiple rows and columns of multiple symbols or values”
Court “multiple rows and columns of multiple symbols or values”

The parties dispute whether this term may be satisfied by just one row and column (Plaintiffs’ position) or requires multiple rows and columns (Defendants’ position). Plaintiffs argue that their construction is supported by the claims; not all matrices are made up of “symbols,” as a matrix could include just integers or other mathematical values. (D.I. 123 at 10) Defendants address this term together with the previous term, relying on the same intrinsic evidence. (D.I. 126 at 7-8). Based on this evidence, the Court again agrees with Defendants. In the patent’s context, a matrix consists of multiple rows and columns of multiple symbols. *See, e.g.*, ’564 patent, claims 1, 5, 11; Figs. 1, 2A and 2B; 2:30-41, 2:57-67, 3:5-29, 3:34-37, 4:35-49, 5:14-65, 6:1-3, 6:29-33, 6:47-50, 7:38-43. Nothing in the intrinsic evidence describes a matrix as consisting of just a single symbol. For instance, the claim language states that the source matrix is formed by “vectors organized in successive rows.” *Id.* Claim 1; *id.* 10:11-12; *id.* Abstract (“source matrix formed by vectors that are organized in successive lines by a linear precoding

³¹This term is present in claims 1-3, 5-7, 9, and 11-13. The parties proposed amended constructions. (See D.I. 133 at 2)

matrix”). Defendants’ construction is also supported by the patent’s description of the claimed invention as “the sending/reception of a signal that implements a precoding matrix in a MIMO (“*Multiple* Input *Multiple* Output”) type *multi*-antenna system.” *Id.* 1:18-21 (emphasis added); *see also* D.I. 142-5 ¶¶ 62-83. The Court further agrees with Defendants that a POSA would not understand symbols to exclude other forms of representation, e.g., constant real or complex numbers, as recited in claim 4. (*See* D.I. 142-5 ¶¶ 84-85)

9. “which have undergone a precoding by a same column of the linear precoding matrix”³² / “having undergone a precoding by a same column of a linear precoding matrix at sending”³³

<p>Plaintiffs Plain meaning. Alternatively, “which have been precoded, including by being multiplied by a same column of [the/a] linear precoding matrix”</p>
<p>Defendants “which are the result of multiplying each row of [the/a] source matrix by a same column of the linear precoding matrix”</p>
<p>Court “which have been precoded, including by multiplying each row of [the/a] source matrix by a same column of [the/a] linear precoding matrix”</p>

The parties agree that the linear precoding step recited in the claim and described in the specification requires multiplication of the rows of the source matrix by the columns of the linear precoding matrix, but dispute whether this step leaves opens the possibility of “additional steps or capabilities” or “‘one or more’ linear precoding matrices,” as Plaintiffs contend. (D.I. 123 at 11) Defendants argue that the “included by” language in Plaintiffs’ construction improperly adds ambiguity instead of clarifying that the “rows of the source matrix are multiplied by the same

³²This terms occurs in claims 1, 11, and 12.

³³This terms occurs in claims 5 and 13.

column,” and the patent discloses no other operation beyond the multiplication identified in both parties’ construction. (D.I. 126 at 9)

For reasons similar to those explained abover, *see Baldwin Graphic*, 512 F.3d at 1342, the claims are open-ended (containing the transitional phrase comprising) and contemplate the possibility of additional operations. The Court, however, modifies Plaintiffs’ construction to clarify that the rows of the source matrix are multiplied by the same column of the linear precoding matrix.

10. “processing said reception matrix, comprising multiplying by a linear de-precoding matrix”³⁴

Plaintiffs Plain meaning. Alternatively, “processing said reception matrix, including by multiplying by a linear de-precoding matrix”
Defendants “processing said reception matrix, including by multiplying the rows of the reception matrix or of a matrix derived from the reception matrix by the columns of a linear deprecoding matrix”
Court “processing said reception matrix, including by multiplying by a linear de-precoding matrix”

The parties agree that the processing of the reception matrix includes multiplying by a linear de-precoding matrix, but raise other disputes. Plaintiffs argue that Defendants’ construction directly conflicts with dependent claim 7. (D.I. 123 at 12) Defendants initially argued that Plaintiffs’ construction improperly broadens the claimed multiplication step because it “fails to specify the order of the matrix multiplication” (D.I. 126 at 109), and then later amended their construction to address Plaintiffs’ argument that it conflicts with dependent claim

³⁴This term is present in claim 5.

7 (D.I. 140 at 10).

The Court agrees with Plaintiffs. Defendants' construction fails because the multiplication order language of multiplying specific rows and columns in the corresponding matrices is not supported by claim 5, which expressly states the order of multiplication where it matters. *See* '564 patent, 10:49-54. Defendants' construction also reads limitations into claim 5 that are already present in its dependent claim 7. *See GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1310 (Fed. Cir. 2014) (holding that court "erred by importing limitations from the dependent claims . . . into the independent claims"); *InterDigital Commc'ns, LLC v. Int'l Trade Comm'n*, 690 F.3d 1318, 1324 (Fed. Cir. 2012) ("The doctrine of claim differentiation is at its strongest in this type of case, 'here the limitation that is sought to be 'read into' an independent claim already appears in a dependent claim.'). (*See also* D.I. 139 ¶ 25)

V. CONCLUSION

The Court construes the disputed terms as explained above. An appropriate Order follows.